[0216] Following manufacture, the pads were rinsed with municipal water held at 110-120° F. to remove any unbound CX. Effluent from the first 0.1 gallon of rinse water contained 0.089 mg/L of CX and no detectable CA isomers. The next 9.9 gallons of rinse water contained no detectable CX or CA isomers.

Example 6

Chlorhexidine Dissolution Data

[0217] For chlorhexidine in its basic form, i.e., without the presence of acids, the published data on saturation levels in water vary widely, with reported values of 10, 26, 61 and even 800 mg/L (ppm) when measured at ambient temperature. Moreover, it is well known that hot water dissolves small molecules to a greater degree than does water at room temperature, because of the greater energy in heat. To test the expected lifetime of CX crystals in the present invention, six 50 mg aliquots of pure CX powder were exposed to 1 liter each of 140° F. (60° C.) municipal water for respective time periods of 0 seconds, 10 seconds, 30 seconds, 90 seconds, 300 seconds, and 1,200 seconds, then the remaining solid CX was removed and the CX concentration in the water was determined. The system was found to approach a 1 mg/L saturation level of CX within the first 10 seconds of exposure to the hot water. This represented just under 2 weight percent of the powder in each case, and no more than that dissolved even with 20 minutes of exposure.

[0218] No chloroani line impurities were detectable in the water. This is believed to be because (a) the chloroaniline content of the residual solid CX was still trapped there, and (b) the chloroaniline content of CX that dissolved into the hot water evaporated during the time trials and the sampling.

[0219] In the foams of the invention much of each crystal surface is not directly exposed to the aqueous medium. Hot-water tests of that system find that CX is undetectable in the effluent, meaning that there is at most ca. 70 μg/L (70 ppb) of dissolved CX. This is a surprising finding: the same foams remain potently microbicidal even though CX cannot be detected in their effluent by the standard analytical methods.

Example 7

Preliminary Data for *Legionella pneumophilia* Serotype 1 (Lp1)

[0220] CX CONTROL: The disinfectant efficacy of free-standing exposed CX surfaces in water was tested by a third-party pathogen laboratory by placing a dose of either 4.5 g, 9 g, or 12 g of solid CX into respective 800-mL volumes of water containing ~9×10^6 colony-forming units (CFU) of Lp1 per mL. The microbial liquids were prepared from the same 3.5-liter 3.0 McFarland suspension. The introduction of CX was done with stirring, and 1-mL samples were taken at intervals of 30, 45, 60, 90, and 120 seconds. Each sample was then added to 9 mL DE broth, which neutralized and terminated the antiseptic activity of CX; then the samples were serially diluted and plated to triplicate BCYE plates for viability counts. The 4.5-g CX run reduced the cell count by log ~0.3 over the first 30 seconds. The 12-g CX run reduced the cell count by log ~4.8 over the course of the 2-minute reaction period. Thus, even at the low concentrations of dissolved CX, this suggested that an inline two-module system is viable: the first for reaction of CX, and the second for adsorbing or absorbing any CX that dissolves. The tested foam was from Example 1 above.

[0221] FOAM TRIAL: The disinfectant efficacy of CX partially embedded in reticulated polyurethane foam was tested by ambient pressure (i.e., gravity-driven feed at low influent and filter height) through foam disks with 2.5-inch diameter and 1-inch thickness. Lp1 bacteria were suspended and dispersed in 10 L deionized (DI) water with a cell count of 3.12×10^7 CFU/mL. For each experiment, the filter was pre-wetted with DI water and then 1 L of the suspension was gravity-fed through a single filter housing that contained either the control (reticulated foam disks with no CX) or the test pads (reticulated foam disks with embedded CX). Then 4×0.5 L aliquots were collected from the effluent in each experiment. These aliquots were then sampled, plated, and grown in triplicate on BCYE plates. For the control, the first three aliquots contained nearly the same concentration of live cells as the influent held (all $\geq6\times10^6$ CFU/mL). For the test run, the log reduction was 1.58; collected aliquots had ~2.6% of live cells relative to the influent cell count, or 97.4% reduction. Thus, a stack of filter pads in a cartridge as shown in EXAMPLE 1 was used in subsequent experiments to achieve essentially complete eradication of bacterial cells.

Example 8

Hot Water Tank for *Legionella pneumophilia* Serotype 1 (Lp1).

[0222] A model system was used to simulate growth conditions in large building hot water tanks, to measure the efficacy of the present invention against the environmental full range of *L. pneumophilia* bacteria—not just the Lp1 strain—and also to test it against a mix of Heterotrophic Plate Count bacteria (HPC bacteria).

[0223] The model system consisted of three 19-gallon electric hot water tanks, each with its own respective hot water loop and Watts model 500800 recirculating pump. A manifold combined the returns from each loop and distributed water back to each tank. The system had been constructed of typical materials for building water systems, including copper and PEX piping. The water volume in the combined system was about 60 gallons. The typical system pressure was in the range of 30-40 psi. The operating temperature was in the range of 100-110° F. (37.8-43.3° C.). The flow rate was 1.2-1.5 gallons per minute (GPM). The system was inoculated with environmental L. pneumophilia, that is, not only Lp1 but also other L. pneumophilia strains as well as other associated HPC bacteria. The environmental inoculum was about 5 L containing over 3,000 CFU/mL. The system was maintained and monitored multiple times per week for 8 weeks after inoculation, including sampling and testing for populations of Lp and HPC.

[0224] On the day of evaluation, the system was spiked with a suspension of Lp that had been recovered and grown from a previous sampling, to nominal 10^6 CFU/mL. This served as the control.

[0225] In separate runs, control (meaning filter cartridges like the invention but not containing CX), and test modules (meaning filter cartridges of the invention prepared according to EXAMPLE 1 herein) were mounted inline in the model system's recirculation loops. Then at the end of each run, before sampling about 3.5 L of outflow was drawn off and discarded to remove the system's residual pocket of cold